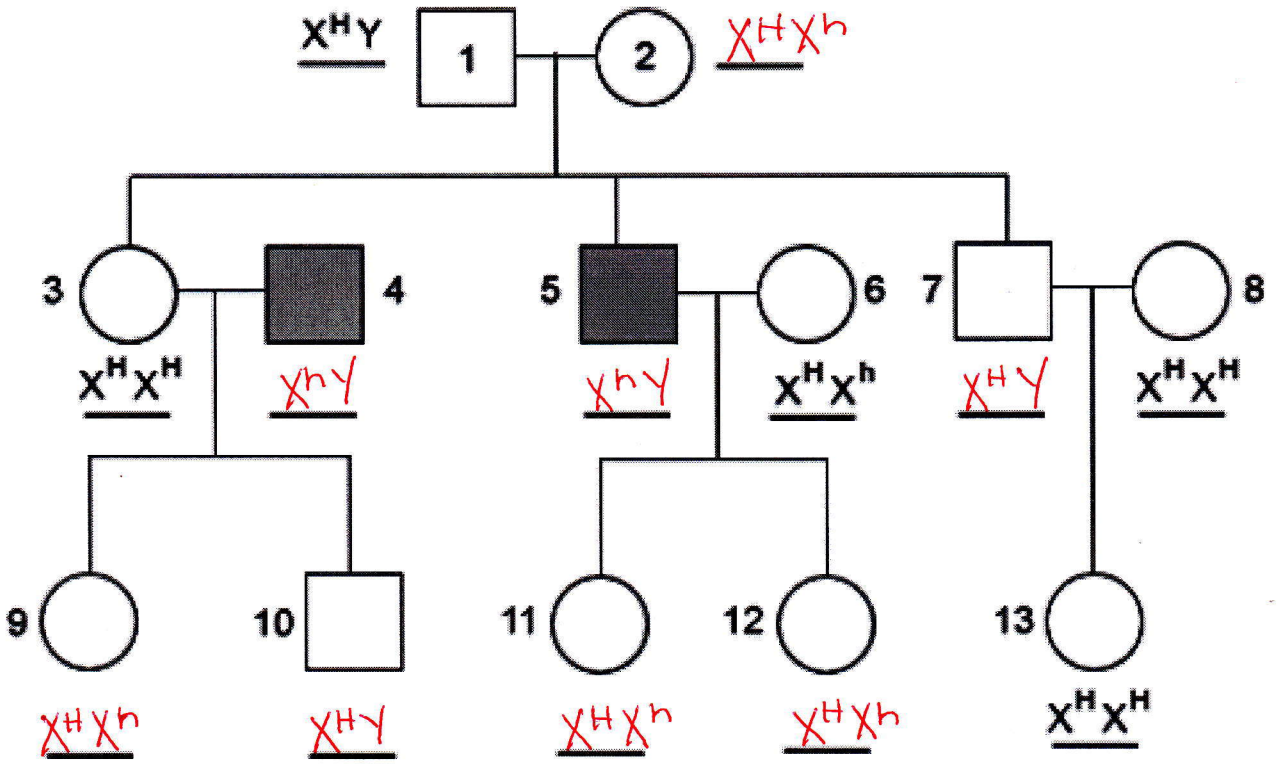
Name _____

Sex-linked Pedigrees

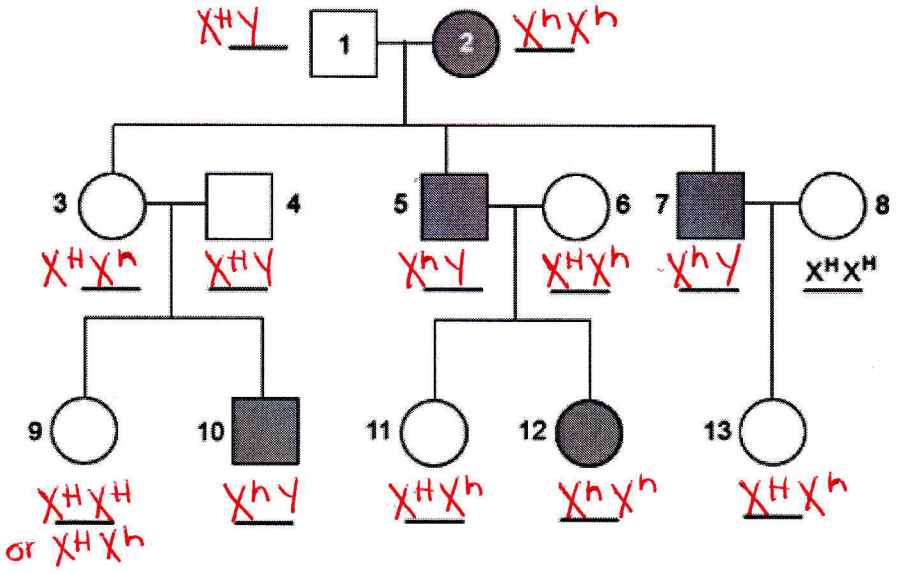
1) Hemophilia is a recessive sex-linked disorder located on the X chromosome where a person's body cannot control blood clotting or coagulation. Write in the genotypes on the line next to/below each individual.



- Why does individual 5 have hemophilia even though neither of his parents do?

His mom is a carrier and he can't mask the recessive allele

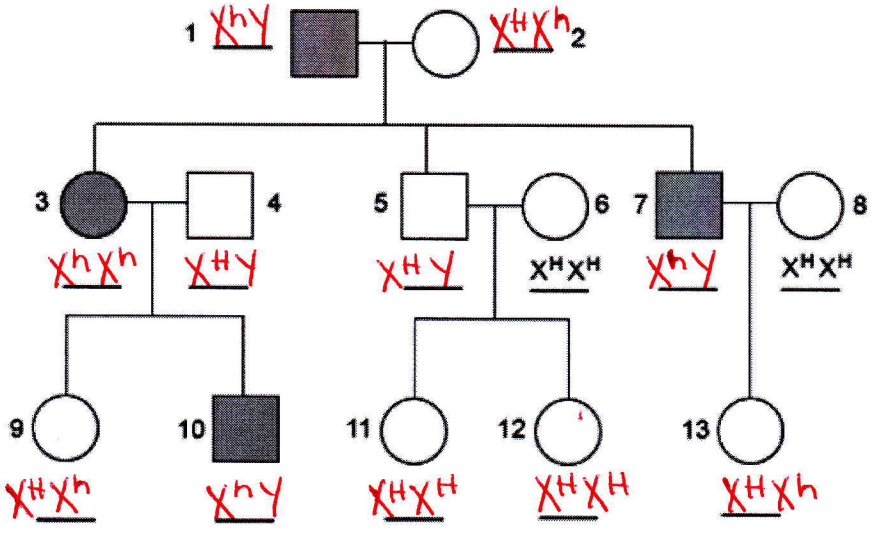
2) Fragile-X syndrome is a recessive sex-linked disorder located on the X chromosome. Below is a pedigree tracing the passing of the fragile-X syndrome gene through 3 generations. Write in the genotypes on the line next to/below each individual.



- Why is it possible for individuals 10 and 12 to have fragile-X syndrome but NOT individuals 9 or 13?

Females have to inherit 2 recessive alleles
Parent 8 is homozygous dominant - can't pass on the recessive
Parent 4 can only pass X^H to females and Y to males

3) Below is a recessive sex-linked pedigree tracing the red-green colorblindness gene located on the X chromosome. Write in the genotypes on the line next to/below each individual.



- Did individual number 7 inherit the colorblindness allele from his mother or father? Explain

mother
Dads can only pass the Y chromosome to their sons

4. Create the following pedigree tracing the inheritance of hemophilia, a **recessive sex-linked** disorder. Use (H) for normal and (h) for hemophilia as the alleles on each X chromosome.

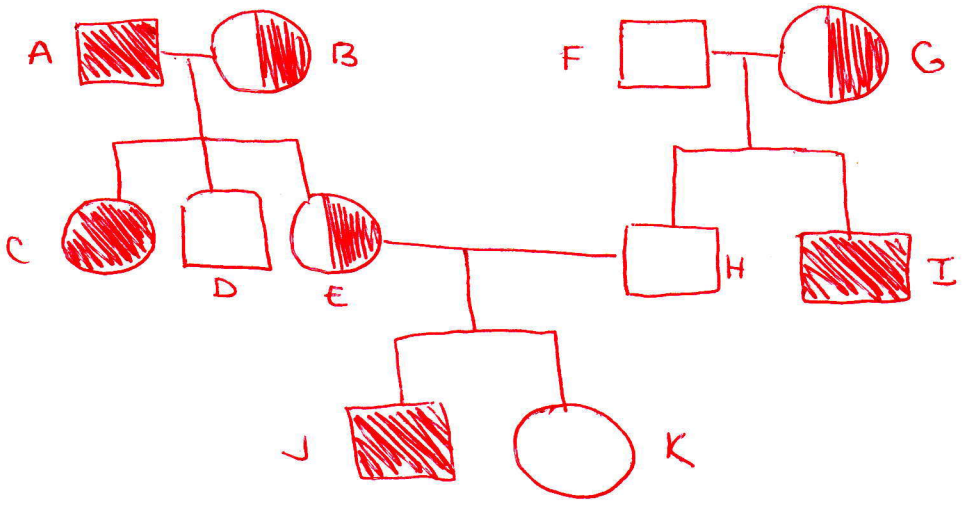
Be sure to:

- Use the correct symbols for males vs females
- Connect the symbols with appropriate lines to show marriage, offspring, and siblings
- Fill in the appropriate symbols to show individuals with the trait
  - Indicate which individuals MUST be carriers by shading in half of their symbol
- Record each individuals genotype in the space provided at the bottom

Family #1
A male with hemophilia (A) marries a normal female (B).
They have 3 kids; a female with hemophilia (C), a normal male (D), and a normal female (E).

Family #2
A normal male (F) marries a normal female (G).
They have 2 sons; one is normal (H), and one has hemophilia (I).

The normal daughter from the first relationship (E), marries the normal son from the second relationship (H).
They have 2 kids; a male with hemophilia (J) and a normal female (K).



Record the genotypes of each individual below:

A X^hY B X^HX^h C X^hX^h

D X^HY E X^HX^h F X^HY

G X^HX^h H X^HY I X^hY

J X^hY K X^HX^H OR X^HX^h

5. Create the following pedigree tracing the inheritance of colorblindness, **a recessive sex-linked** trait. Use (N) for normal and (n) for colorblind as the alleles on each X chromosome.

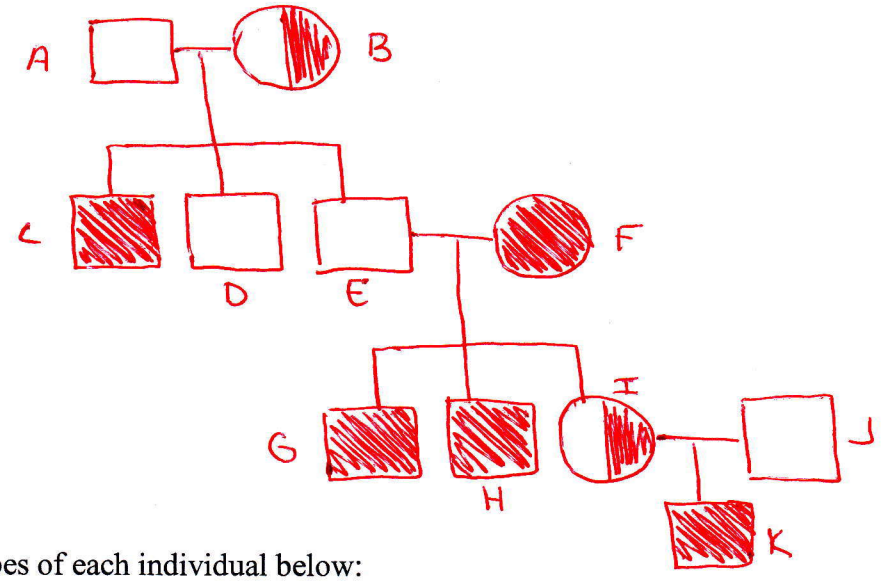
Be sure to:

- Use the correct symbols for males vs females
- Connect the symbols with appropriate lines to show marriage, offspring, and siblings
- Fill in the appropriate symbols to show individuals with the trait
    - Indicate which individuals MUST be carriers by shading in half of their symbol
- Record each individuals genotype in the space provided at the bottom

A normal male (A) marries a normal female (B).
They have 3 sons; a colorblind male (C), and two normal males (D and E).

Their third son (E) marries a colorblind female (F).
They have 3 kids; two colorblind males (G and H), and one normal female (I).

Their normal daughter (I), marries a normal male (J).
They have 1 colorblind son (K).



Record the genotypes of each individual below:

A X^NY B X^NX^n C X^nY

D X^NY E X^NY F X^nX^n

G X^nY H X^nY I X^NX^n

J X^NY K X^nY